MEMORANDUM

TO: Anthony Barrett, Town Manager

FROM: Marc Orlando, Assistant Town Manager, Growth Management

RE: DNR Study: Water Quality Concerns in the May River

DATE: 2/10/2010

CC: Milt Rhodes, Director, Office of Planning & Environmental Sustainability

Staff reviewed the recently released South Carolina Department of Natural Resources study entitled "Water Quality Concerns in the May River: Analysis of Monitoring Data Collected by the Town of Bluffton and the Palmetto Bluff Development". Background, summary, considerations and recommendations as well as a path forward are presented below:

BACKGROUND:

- Focused interest in water quality impairment began with the Clean Water Task Force's "Blueprint for Clean Water" in 1997. The Town of Bluffton commissioned the "May River Baseline Study" conducted in 2002- 2003. Recommendations from both of these documents have guided the Town of Bluffton's water quality sampling research. The current statistical analysis study synthesizes nearly 15 years of data to provide guidance not only for the Town's future monitoring programs, but also for future Town policies.
- Study is part of the May River Watershed Action Plan.
- Goal of the May River Watershed Action Plan is to create an environment in which the May River can reach a dynamic equilibrium.
- Study was procured by the Town on February 12, 2009.
- Purpose of study was to analyze all existing data, develop trends for various water quality indicators over time, and to make recommendations for future study / data collection.
- Data sets from various studies by the Town of Bluffton, Palmetto Bluff, SC Department of Health and Environmental Control and SC Department of Natural Resources were utilized.
- Long-term data from 1994 to 2008 underwent quality control measures prior to being statistically analyzed via commonly utilized methods such as analysis of covariance, analysis of variance and regression analysis.
- The study attempted to answer 3 main questions:

1. Are significant changes in water quality occurring in the May River?
2. Are developed drainages acting as significant sources of pollutants to the May River system?
3. What monitoring efforts will be most valuable and feasible to continue in the future?

SUMMARY:

- Most of the May River does not appear to be degraded with respect to fecal coliform concentrations.
- The upper portion of the river shows signs of degradation with respect to fecal coliform concentrations.
- Degradation at the upstream portion of the river may extend to other parts of the river if recent trends continue.

QUESTION 1: Are significant changes in water quality occurring in the May River?

- Salinity appears to be increasing over time throughout the river.
- Increasing salinity suggests that the total volume of freshwater entering the river is decreasing over time.
- Salinity was closely tied to rainfall with less salinity coming in times of heavy rainfall.
- As a whole, the river has seen an increase in fecal coliform concentrations since the mid to late 1990's.
- Increasing salinity and increasing fecal coliform concentrations suggest an increase in sources of fecal coliforms (wildlife, domestic animals, etc.) rather than an increase in total runoff volume or that runoff has become more episodic.
- The upper portion of the river has higher and more rapidly increasing fecal coliform levels than the rest of the river and is most likely due to a combination of water body size, flushing rate, and development trends.
- Freshwater inflows play an important role in fecal counts in the river.
- Higher freshwater inflows are directly tied to higher fecal counts
- Fecal levels are closely related to rainfall patterns.
- Nutrient levels, dissolved oxygen (DO), pH and total suspended solids (TSS) did not show a significant change over time.
- Nutrient levels, DO, pH, and TSS show more degradation in the upper portion of the river.
- Nutrient levels, DO, pH, and TSS are not problematic at this time.

QUESTION 2: Are developed drainages acting as significant sources of pollutants to the May River system?

- Question can not properly be answered without additional data collection.

- Palmetto Bluff watersheds did not show evidence of large amounts of fecal coliform pollution.
- In Palmetto Bluff, developed drainages showed little evidence of degraded water quality when compared to undeveloped drainages.
- At Palmetto Bluff, fecal coliform concentrations were highest in undeveloped drainages.
- A comparison of developed versus undeveloped drainages on the north side of the river could not be made with current data.
- Wet / rain event samples from the north side of the river had significantly elevated fecal coliform levels, nutrient concentrations, and turbidities as compared to both developed and undeveloped drainages on the Palmetto Bluff side of the river.
- High levels of fecal coliforms, nutrients, and turbidities in the northern watersheds may be a result of the different land cover / land use and flushing rates as compared to the Palmetto Bluff watersheds.

QUESTION 3: What monitoring efforts will be most valuable and feasible to continue into the future?

- Data collection efforts should be continued in order to understand the river as it changes naturally over time, unnaturally over time, and to be more able to predict changes before they occur.
- Data collection and study helps prevent "knee-jerk" reactions and subjective decision making.
- Data collection should be expanded in some areas, reduced in others, and relocated at several others.
- Data collection methodology and timing should be standardized as soon as possible to ensure a valid comparison of watersheds.
- Data collection methods, locations, and timing recommendations are detailed in the study.

RECOMMENDATIONS & CONSIDERATIONS:

- Evaluate controlling runoff "flashiness" by controlling and slowing the release of stormwater over a longer period of time.
- Evaluate wildlife populations in context of the carrying capacity of the land. Carrying capacity of the land is the amount of wildlife that a particular area can support on sustainable level.
- Evaluate the impact that development has on wildlife populations.
- Re-evaluate the idea that developed areas are producing the highest fecal concentrations.
- Evaluate the concept of focusing our efforts in natural areas as they seem to be a large contributor of fecal coliforms.
- Realizing that the stormwater volume ordinance was based on the best available science at the time, re-evaluate stormwater volume requirements as a means of controlling fecal coliform levels entering the May River especially in light of the evidence presented by this study.

- Adopt sampling methodology, locations, and timing as presented in this report.
- Continue to monitor nutrients in selected locations.

PATH FORWARD:

- Present study to Town Council as a workshop item.
- Review study with Water Quality Technical Advisory Committee and seek recommendations from committee.
- Present recommendations to May River Waterbody Management Plan Implementation Committee.
- Act upon recommendations as presented by May River Waterbody Management Plan Implementation Committee.
- Goal of May River Watershed Action Plan is to create a dynamic equilibrium with respect to the condition of the May River